ZooKeys 658: 81–87 (2017)
doi: 10.3897/zookeys.658.11501
http://zookeys.pensoft.net

RESEARCH ARTICLE

A peer-reviewed open-access journal
ZooKeys
Launched to accelerate biodiversity research

A new species of *Poropoea* Foerster from Africa (Hymenoptera, Chalcidoidea, Trichogrammatidae)

Stefania Laudonia[1], Gennaro Viggiani[1], Silvano Biondi[2]

1 *Department of Agriculture (BIPAF), University of Naples Federico II, Via Università 100, Portici (Naples) 80055, Italy* **2** *Via E. di Velo 137, I Vicenza 36100, Italy*

Corresponding author: *Stefania Laudonia* (laudonia@unina.it)

Academic editor: *M. Ohl* | Received 15 December 2016 | Accepted 9 February 2017 | Published 23 February 2017

http://zoobank.org/BCAE3E15-9A8E-4791-BC20-C6747491C88C

Citation: Laudonia S, Viggiani G, Biondi S (2017) A new species of *Poropoea* Foerster from Africa (Hymenoptera, Chalcidoidea, Trichogrammatidae). ZooKeys 658: 81–87. https://doi.org/10.3897/zookeys.658.11501

Abstract

A new species of *Poropoea* Foerster (Hymenoptera, Chalcidoidea, Trichogrammatidae) was obtained from eggs of attelabid beetles (Coleoptera: Attelabidae) associated with *Combretum* sp. (Myrtales, Combretaceae). This species is described from Ogooué-Ivindo province in north-eastern Gabon. The new species is easily distinguished from the known members of the genus *Poropoea* by the following combination of characters: female antennal club unsegmented, premarginal vein of the fore wing with a nodular premarginal vein and the stigma of the stigmal vein black, the wing lacks the RS1 track; front and hind legs more robust than the middle leg and with coxa and femur markedly enlarged, and ovipositor exserted to one-third of the gaster length. Morphological features of this new species are discussed and illustrated. A key to females of *Poropoea* species lacking the Rs1 track in the fore wing has been constructed and is presented here.

Keywords

Attelabidae, club unsegmented, key, leaf-rolling weevils, *Paratomapoderus brachypterus*

Copyright *Stefania Laudonia et al.* This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Introduction

The trichogrammatid genus *Poropoea* Foerster, 1851 (Hymenoptera, Trichogrammatidae) currently contains 19 species (Noyes 2017), well-known as egg parasitoids of leaf rolling attelabid beetles (Coleoptera: Attelabidae), which are distributed in the Palaearctic, Oriental, and Nearctic regions (Girault 1911, Silvestri 1916, Nowicki 1936, Hirose 1963, Viggiani 1968, Subba Rao 1969, Lin 1994, Luo and Liao 1994, Lou et al. 1996, Kobayashi and Kato 2004, Fursov 2007, Narendran and Hayat 2007, Hayat and Poorani 2013). A *Poropoea* sp. associated with *Apoderus humeralis,* currently included in the genus *Cycnotrachelodes* (Olivier) (Coleopera, Attelabidae) (Reckhaus 1997) was reported from the Afrotropical realm, Madagascar sub-region (Zwick 2009). Recently, female specimens of a *Poropoea* sp. have been collected in Gabon from eggs of *Paratomapoderus brachypterus* (Voss) (Coleoptera, Attelabidae, Apoderinae, Hoplapoderini), in leaf rolls of a species of *Combretum* Loefl. belonging to the Combretaceae. Their taxonomic study showed that they represent an undescribed species, clearly differentiated from all other species of the genus *Poropoea*. This new species, the first record of a member of the genus for the West-Central African sub-region, is described herein, and a key to the females of *Poropoea* species lacking the Rs1 track in the fore wing is given.

Materials and methods

From a *Combretum* sp., 67 leaf rolls of *P. brachypterus* were sampled from 15 to 25 June 2016 in Gabon, Ogooué-Ivindo, Ivindo National Parc, Ipassa Makokou Strict Nature Reserve, Station de Recherche de Ipassa, 500m a.s.l; 0°30'43"N, 12°48'12"E. The emerged parasitoids, two specimens, were initially preserved in 70% alcohol. These specimens were later dissected and mounted on slides using balsam-phenol as permanent mounting medium. For the terminology, Doutt and Viggiani (1968) and Pinto (2006) were followed.

Taxonomy

Poropoea africana **Laudonia & Viggiani, sp. n.**
http://zoobank.org/E2FA26B9-B944-4572-ABA3-902EAF14C926
Figs 1–6

Holotype ♀ (on slide). Gabon: Ogooué-Ivindo, Parc N. Ivindo, Station de Recherche de Ipassa, m a.s.l 500; 0°30'43"N, 12°48'12"E (DMS), June 2016, leg. Silvano Biondi. **Paratype**: 1 ♀, same data as holotype. Holotype and paratype will be deposited in the Entomological collection of the Dipartimento di Agraria dell'Università degli Studi "Federico II", Portici, Napoli, Italia.

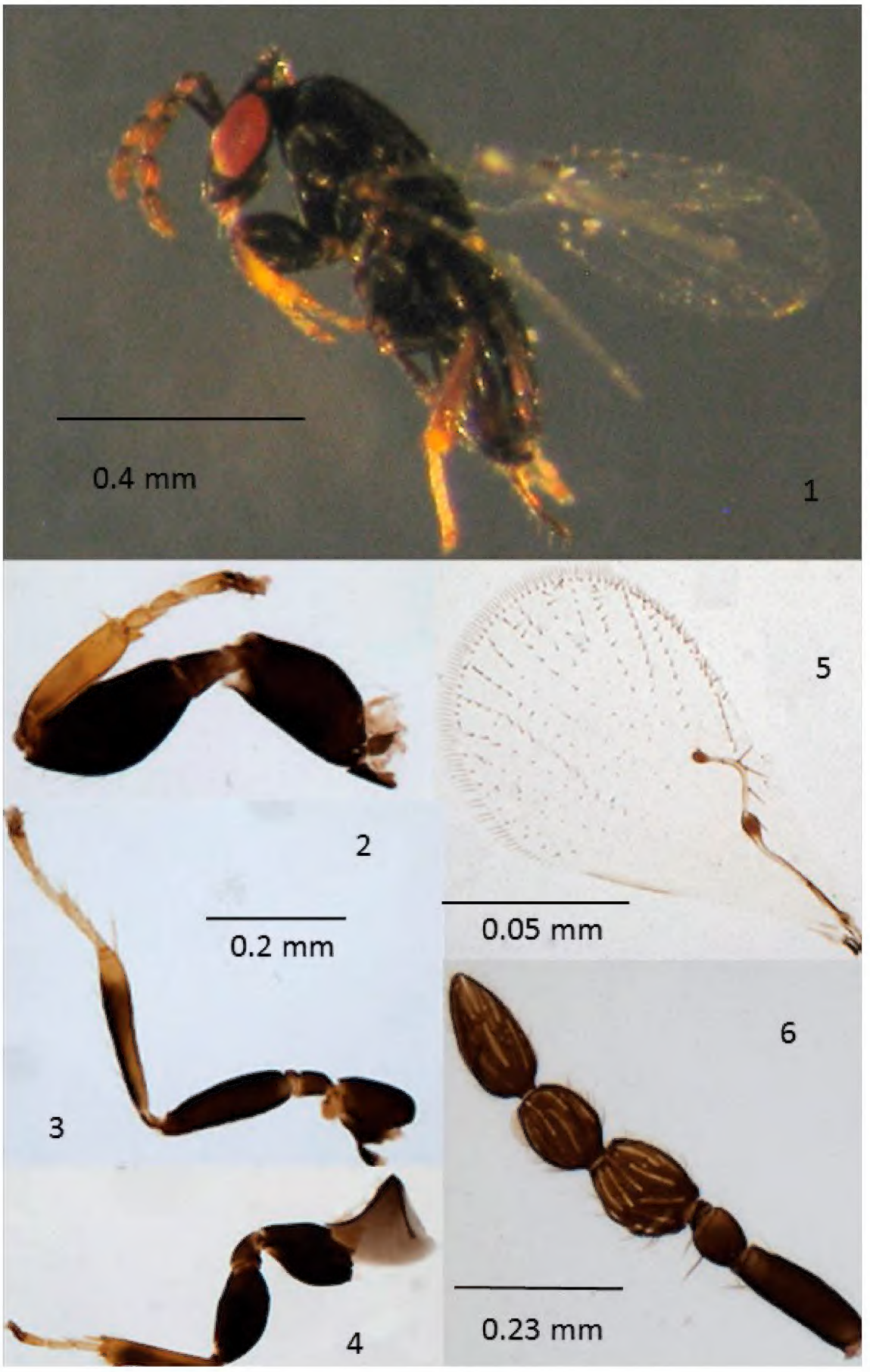

Figure 1–6. *Poropoea africana*, holotype female**. 1** adult **2** fore leg **3** middle leg **4** hind leg **5** fore wing **6** antenna.

Diagnosis. The new species is easily distinguished from the known members of the genus *Poropoea* by the following combination of characters: female antennal club unsegmented; premarginal vein of the fore wing with a basal "knot" and stigma of the stigmal vein black; lack of RS1 track in the fore wing; front and hind legs more robust than the middle ones, and with coxa and femur markedly enlarged; and ovipositor exserted for

one-third of the gaster length. For the lack of the RS1 track on fore wing, *P.africana* shares this character only with *P. bella* Hayat et Poorani, *P. longicornis* Viggiani, and *P. orientalis* Subba Rao, but it is unique in having the club unsegmented, a nodular premarginal vein, and the coxa and femur of the front and hind legs markedly enlarged.

Description. Female (Fig. 1): Body length 1.18 mm. Body dark brown and shiny, ocelli and eyes red; antennae, legs (except the yellow-ochraceous tarsi, front tibia, distal part of middle and hind legs), and exserted part of the ovipositor, concolourous with the body. Fore wing hyaline but with basal half of the sub costal vein, base of premarginal vein and stigma of the stigmal vein dark brown. *Head* lenticular, 2.6 wider than long. Maxillary palps 2-segmented and labial palps vestigial. Mandibles with two external acute teeth. Antennal formula 1,1,(2), 2,1 (Fig. 6); scape narrow, three times as long as wide; pedicel small, almost as long as wide; two small anelli present; first funicular segment clearly wider than the second one and 1.3 as long as wide; second funicular segment smaller than the first, 1.2 as long as wide; club coniform, unsegmented, 1.6 as long as the second funicular segment; antennal segments with short and scanty setae; funicular segments with two and club with three rows of longitudinal sensilla. *Mesosoma* rather flat, same plane and slightly longer than metasoma; pronotum short, mid lobe of mesoscutum as long as scutellum but slightly longer and wider, both with a shallow reticulate sculpture and with two pairs of setae; mid lobe of mesoscutum and scutellum without a longitudinal median groove; metanotum very short, with 2-3 transversal thickenings; propodeum medially slightly longer than metanotum with a pair of large, ovoid spiracles near the anterior margin of the sclerite and a thickened strand starting from the internal spiracle margin and reaching the middle of the propodeum. Fore wing (Fig. 5), twice as long as broad, with subcostal, premarginal, marginal, and stigmal vein ratios 23:10:8:8, premarginal vein with a basal nodule and with one seta; arched marginal vein which fails to attain the anterior wing margin, with three setae, stigmal vein with a short seta in the middle; blade without cilia from base to below the level of stigmal vein, with 15 rows of cilia distinct reaching the distal margin of the wing and with few small cilia between them, vein track RS1 lacking; fringe very short, the longest cilia 12.5 times shorter than discal area width. Hind wing with two rows of cilia along anterior margin and two rows of cilia along the posterior margin. Fore leg (Fig. 2) evidently enlarged, with coxa and femur each 1.8 times as long as broad; femur with an outer margin convex; tibia as long as femur length, with its distal end provided with a single spine and a short and bifid apical spur; tarsus shorter than tibia (30:40) with first two tarsomeres sub-equal, approximately twice as long as wide, third tarsomere slightly longer. Middle leg (Fig. 3) thinner than the fore leg, with femur 3.6 times as long as wide; tibial spur a little shorter than basitarsus, the latter narrow and a little shorter than the following two segments combined. Hind leg (Fig. 4) with femur enlarged, twice as long as broad; tibia 1.2 times the femur length and distally provided with a whorl of short, coniform spines, and with a robust spur, shorter than basitarsus.

Metasoma shorter than mesosoma (48:41); ovipositor inserted at level of the first segment of gaster with the exserted part one-third as long as metasoma length; third valvulae nearly one-third the total length of the ovipositor; stylets very long.

Male. unknown.

Etymology. The name refers to the continent of the collection site.

Distribution. Gabon, West-Central Africa.

Remarks. The new species is easily distinguished from the known members of the genus *Poropoea.* The markedly enlarged coxa and femur of the front and hind legs is an interesting character which appears to be clear adaptations to host parasitisation [probably for body stability and propulsive efficiency of the ovipositor], and not reported for any other species of the genus *Poropoea.* Similar features of the legs are present in the male of *Blastophaga psenes* (L.) (Hymenoptera, Chalcidoidea, Agaonidae), a well-known gall maker and pollinator of *Ficus carica* and in other fig-wasps only (Grandi 1929, Hill 1967).

Some characters of *P. africana*, such as the antennal formula, the nodular premarginal vein, and the and modified legs, may suggest the inclusion of this species at least in a new subgenus, but this proposal is deferred until more material, including males, could be collected for a proper evaluation of these characters.

Key to females of *Poropoea* species lacking of the Rs1 track in the fore wing

1 Antennal formula 1(scape), 1(pedicel), (2)(anelli), 3 (funicle), 2 (club).....**2**

– Antennal formula 1, 1, (2), 2, (3) or 1, 1, (2), 2, 1.....**3**

2 Exserted part of the ovipositor about as long as meso-and metathorax combined; funicular segments at least 2.5 times as long as wide ....***P. longicornis*** **Viggiani**

– Exserted part of the ovipositor as long as head, meso-and metathorax combined, funicular segments a little more than 2 times as long as wide ....***P. orientalis*** **Subba Rao**

3 Antennula formula 1,1,(2), 2, (3); mid lobe of mesoscutum and scutellum with a longitudinal, median groove; normal legs ....***P. bella*** **Hayat & Poorani**

– Antennal formula 1,1,(2), 2,1; mid lobe of mesoscutum and scutellum without a longitudinal, median groove; middle legs markedly smaller than fore and hind legs .....***P. africana*** **sp. n.**

References

Doutt RL, Viggiani G (1968) The classification of the Trichogrammatidae (Hymenoptera: Chalcidoidea). Proceedings of the California Academy of Sciences 35: 477–586.

Foerster A (1851) Eine Centurie neuer Hymenopteren. Vierte und fünfte Dekade. Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande und Westfalens, Bonn, 8, 28 pp.

Fursov VN (2007) Family Trichogrammatidae. Trichogrammatid wasps. In: Lelej AS (Ed.) Key to Insects of the Russian Far East – 4(5): Neuropteroidea, Scorpionflies Hymenopterans. Dal'nauka,Vladivostok, 963–989. [In Russian]

Girault AA (1911) Synonymic and descriptive notes on the chalcidoid family Trichogrammatidae with descriptions of new species. Transactions of the American Entomological Society 37: 68. http://biostor.org/reference/58415

Grandi G (1929) Studio morfologico e biologico della *Blastophaga psenes* (L). 2a edizione riveduta. Bollettino del Laboratorio di Entomologia del R. Istituto Superiore Agrario di Bologna 2: 1–147. http://www.biodiversitylibrary.org/part/136308 [In Italian]

Hayat M, Poorani J (2013) A new species of *Poropoea* Foerster (Hymenoptera: Trichogrammatidae) from India. Oriental Insects 46(3/4): 255–259. http://dx.doi.org/10.1080/00305316.2012.752616

Hill D S (1967) Fig-wasps (Chalcidoidea) of Hong Kongs I. Agaonidae. Zoologische Verhandlingen. Leiden 100: 1–55. http://dare.uva.nl/cgi/arno/show.cgi?fid=149169

Hirose Y (1963) Discovery of the genus *Poropoea* parasitic on the eggs of attelabid beetles in Japan (Hymenoptera, Trichogrammatidae). Acta Hymenopterologica (Tokyo) 2: 30. http://www.worldcat.org/title/acta-hymenopterologica/

Kobayashi C, Kato M (2004) A new species of *Poropoea* (Trichogrammatidae) oviposits by entering through the oviposition hole of attelabid beetle. Contributions from the Biological Laboratory (Kyoto University) 29: 431–436. http://hdl.handle.net/2433/156410

Lin NQ (1994) Systematic studies of Chinese Trichogrammatidae. Contributions of the Biological Control Research Institute, Fujian Agricultural University, Special Publication Chongqing Publishing House, Chongqing 4: 1–362.

Lou JX, Ding XY, Wang XQ (1996) Three new species of Trichogrammatidae from China (Hymenoptera: Chalcidoidea). Journal of Shenyang Agricultural University 27(1): 41–42.

Luo WD, Liao D (1994) A new species of the genus *Poropoea* Foerster from China (Hymenoptera: Trichogrammatidae). Acta Zootaxonomica Sinica 19(4): 490–493.

Narendran TC, Hayat M (2007) A new species of Poropoea Förster (Hymenoptera: Trichogrammatidae) from India with a key to Oriental species. Records of the Zoological Survey of India 107(4): 1–5. http://faunaofindia.nic.in/PDFVolumes/records/107/04/index.pdf

Noyes JS (2017) Universal Chalcidoidea Database. http://www.nhm.ac.uk/chalcidoids

Nowicki S (1936) Descriptions of new genera and species of the family Trichogrammidae (Hym., Chalcidoidea) from the Palearctic region, with notes – II. Zeitschrift für Angewandte Entomologie 23: 114–148. http://www.nhm.ac.uk/resources/research-curation/projects/chalcidoids/pdf_X/Novick936.pdf

Pinto JD (2006) A review of the New World genera of Trichogrammatidae (Hymenoptera). Journal of Hymenoptera Research 15(1): 38–163. http://www.archive.org/stream/journalofhymenop00inte/journalofhymenop00inte_djvu.txt

Reckhaus P (1997) Maladies et ravageurs des cultures maraichères: à l'exemple de Madagascar. Margraf, Weikersheim, 402 pp.

Silvestri F (1916) Contribuzione alla conoscenza del genere *Poropoea* Förster. Bollettino del Laboratorio di Zoologia generale e agraria della R.Scuola Superiore d'Agricoltura in Portici 11: 120–135. http://biodiversitylibrary.org/page/8337906

Subba Rao BR (1969) Two new species of *Poropoea* Forster from the Orient, with a key to species (Hymenoptera: Trichogrammatidae). Oriental Insects 3(4): 319–325. http://dx.doi.org/10.1080/00305316.1969.10433923

Viggiani G (1968) Ricerche sugli Hymenoptera Chalcidoidea XVII. Nuove specie di Trichogrammatidae. Bollettino del Laboratorio di Entomologia Agraria Filippo Silvestri 26: 251–262. http://www.nhm.ac.uk/resources/research-curation/projects/chalcidoids/pdf_X/Viggia968c.pdf

Zwick P (2009) Biogeographical Patterns. In: Resh VH, Cardé RT (Ed.) Encyclopaedia of Insects (2nd edn). Academic Press, San Diego, 82–91. http://dx.doi.org/10.1016/B978-0-12-374144-8.00032